

Remarks/Arguments

Applicant has carefully considered the rejection in the previous office action and submits the following response. In the present response, claims 1, 3, 33, 47, 58, 63, 79, 97, 111, and 121 have been amended to more particularly and distinctly define the invention, and new claims 123-126 have been added. The amendments add no new matter, and are believed to place the application in condition for allowance.

Rejections under 35 U.S.C. § 103-Background

The present application is directed to lubricants for drilling fluids, to drilling fluids comprising the lubricants, and to a method for prolonging life of drilling equipment comprising the lubricants. The specification explains that:

[0010] Previous lubricants, sometimes called boundary lubrication additives, generally used fatty acid soaps of metals having a relatively high valence, such as aluminum. Most current drilling fluid systems comprise polymeric materials which tend to react with metals having valences greater than 1. The reaction between the polymeric material and a high valence metal in a fatty acid soap adversely affects drilling fluid properties.

[0011] The metals of the fatty acid soaps used in the present lubricants have a lower valence. These low valence metals do not tend to react with polymers used in current systems, and successfully form an effective lubricating film on metal equipment to which the lubricant is exposed. As a result, merely including the lubricant in a drilling fluid system extends the life of the drill string and casing.

* * *

[0013] The resulting lubricating film provides effective lubrication to metal surfaces subject to friction, such as the metal surfaces of a drill bit or other bearing surfaces, even under high temperature, high pressure conditions. Using a fluid system comprising the lubricant reduces torque and drag, prolongs bit bearing life, reduces friction wear between metal surfaces, e.g. between the drill string and the casing, and reduces corrosion.

Specification, pl 3, ll. 3-p. 4, l. 1.

-Rejection over U.S. Patent No. 6,448,207 to Fukutani et al.

The examiner rejected claims 1-9, 13-24, 33-35, 37-41, 47-52, 58-60, 63-67, 69-74, 79-81, 83-88, 97-103, and 111-113 as obvious over U.S. Patent No. 6,448,207 to Fukutani et al.

Response

The examiner has the burden to establish a *prima facie* case of unpatentability of the pending claims on any grounds, including anticipation and obviousness. *In re Oetiker*, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). In order to establish that the claims are *prima facie* obvious over the prior art, the examiner must point to two things in the prior art, and not in the applicant's disclosure--(1) the suggestion of the invention, and (2) the expectation of its success. *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). The examiner has not met this burden with respect to the amended claims.

-Claims 1-9, 13-24, 33-35, 37-41, 47-52, 58-60 directed to lubricants

Fukutani is directed to a metal working fluid which "contains a metal stearate, a carbonate, a hydrogencarbonate, and a surfactant. The metal working fluid may further contain ethyleneglycol and a rust inhibiter." Fukutani, abstract.

As amended, the independent claims are directed to lubricants for drilling fluid systems "consisting essentially of" the components enumerated in claims 1, 33, 47, or 58, or claims depending therefrom.

The examiner has not pointed to a teaching or suggestion in Fukutani of a lubricant "consisting essentially of" a "dispersion in a carrier fluid" of "at least one fatty acid soap comprising at least one alkali metal having a valence of 1." Claim 1. The examiner has not pointed to a teaching or suggestion in Fukutani of a lubricant "consisting essentially of" a "dispersion in a carrier fluid" of "at least one fatty acid soap comprising lithium." Claim 33, emphasis added. The examiner has not pointed to a teaching or suggestion in Fukutani of a lubricant "consisting essentially of" a "dispersion in a carrier fluid" of "stearate comprising at least one alkali metal having a valence of 1." Claim 47 (emphasis added). The examiner certainly has not pointed to a teaching or suggestion in Fukutani of a lubricant "consisting essentially of" a "dispersion of lithium stearate in a carrier fluid." Claim 58 (emphasis added).

Regardless of whether the phrase "drilling fluid system" in claims 1, 33, 47, or 58 is given weight or not, the examiner has not pointed to a teaching or suggestion in Fukutani of a lubricant "consisting essentially of" the components of claims 1, 33, 47, or 58.

The examiner has not established that a person of ordinary skill in the art would be

motivated to modify Fukutani in the manner required to produce the claimed combination. “[A] rejection cannot be predicated on the mere identification [in a single cited reference] of individual components of claimed limitations. Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.” *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317-1318 (Fed. Cir. 2000).

The examiner has not made particular findings as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected the claimed components for combination in the manner claimed. *Id.* The examiner certainly has not provided a “finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [Applicant’s] invention to make the combination in the manner claimed.” *Id.* at 1318.

Applicant respectfully requests that the rejection of claims 1-9, 13-24, 33-35, 37-41, 47-52, 58-60 over Fukutani be withdrawn.

-Claims 63-67, 69-74, 79-81, 83-88, 97-103, and 111-113

With respect to claims 63-67, 69-74, 79-81, 83-88, 97-103, and 111-113 directed to a “drilling fluid system,” the examiner has not pointed to a teaching or suggestion in Fukutani of a drilling fluid system meeting the following limitations:

Claim	Limitation
63	a dispersion comprising a quantity of at least one fatty acid soap comprising at least one alkali metal selected from the group consisting of lithium, potassium, rubidium, cesium, and combinations thereof
79	a dispersion comprising a quantity of at least one fatty acid soap comprising lithium
97	a dispersion comprising a quantity of at least one fatty acid soap comprising stearate
111	A drilling fluid system comprising a dispersion comprising a quantity of lithium stearate

The examiner therefore has not pointed to a teaching or suggestion of the invention defined by the claims in Fukutani. *In re Vaeck*, 20 U.S.P.Q.2d at 1442.

The examiner has not established that a person of ordinary skill in the art would be motivated to modify Fukutani in the manner required to produce the claimed combination. 1318. The examiner has not made particular findings as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected the claimed components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d at 1317-1318. The examiner certainly has not provided a "finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [Applicant's] invention to make the combination in the manner claimed." *Id.* at 1318.

As seen from the foregoing, it simply is not material whether the phrase "drilling fluid system" in the preamble should be given weight.¹ However, in the present case, the body of claims 63-67, 69-74, 79-81, 83-88, 97-103, and 111-113 does depend on the preamble of the claims for completeness. The phrase "drilling fluid system" is defined in the application:

The present application relates to "drilling fluid systems," defined as fluid systems or components thereof which are "useful during drilling operations." "Drilling fluid systems" include but are not necessarily limited to systems that are useful during "drilling," "drill-in," "completion," "workover," and "cementing" operations. Preferred "drilling fluid systems" are drilling and drill-in fluid systems.

Specification, paragraph [0008]. The application explains that:"[i]n order to be effective for use during drilling operations, the particular fluid system must have effective rheological and fluid loss control properties." Paragraph [0025], p. 7, l. 17-18. The claims to a drilling fluid system also specify that the "dispersion comprising a quantity of at least one fatty acid soap" is "effective to form a coherent lubricating film on metal surfaces of drilling equipment exposed to said dispersion." See e.g., claim 63. The claims would be incomplete unless the phrase "drilling fluid system" in the preamble is given weight.

The cases cited by the examiner are not to the contrary. *In re Hirao*, 190 U.S.P.Q. 15 (C.C.P.A. 1976) and *Kropa v. Robie*, 88 U.S.P.Q. 478, 481 (C.C.P.A. 1951). The claims at issue

¹ The examiner argues that "the preamble language 'lubricants for drilling fluid systems' is a statement of intended use which carries no weight in the composition claims." According to the examiner, "[a] preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone."

in *Hirao* were process claims. *In re Hirao*, 190 U.S.P.Q. 19. *Hirao* does not apply to the pending product claims.²

Kropa was an appeal from a decision in an interference. *Kropa v. Robie*, 88 U.S.P.Q. at 481. The issue in *Kropa* was whether the phrase "an abrasive article," used in the preamble of the counts, was "essential to point out the invention defined by the counts." *Id.* The C.C.P.A. found that the words 'an abrasive article' "[gave] life and meaning to the counts, for it is only by that phrase that it [could] be known that the subject matter defined by the claims [was] comprised as an abrasive article." *Id.* The C.C.P.A. noted that "[e]very union of substances capable inter alia of use as abrasive grains and a binder is not an 'abrasive article. The term calls forth a distinct relationship between the proportions of grain and resin comprising the article. . . . The term 'abrasive article' is a vital term of the counts, and the meaning must be taken from the application in which the counts originated." *Id.* According to the C.C.P.A. "it is a limitation which is material to the issue, and must be observed." *Id.*

The same is true with respect to the phrase "drilling fluid system" used in the preamble of the pending claims. This is particularly true with respect to claims 63-67, 69-74, 79-81, 83-88, 97-103, and 111-113, which are directed to a "drilling fluid system."

Like the phrase "abrasive article" in *Kropa*, the phrase "drilling fluid system" gives "life and meaning" to the claims. Here, as in *Kropa* every union of substances capable of use as "a dispersion comprising a quantity of at least one fatty acid soap" is not a "drilling fluid system." The phrase "drilling fluid system" calls forth distinct properties that must be present in the claimed composition. And, the claims specify that the quantity of fatty acid soap forms "a coherent lubricating film on metal surfaces of drilling equipment exposed to said dispersion."

² In *Hirao*, it was stipulated that "the first two steps [of the claims] (forming high purity maltose) would have been unobvious from the art of record, while the third step (using high purity maltose as a sweetener) would have been obvious" in view of two references. It also was uncontested that "the high purity maltose product formed by the first two steps and the high purity maltose product of the prior art 'may be considered the same as far as the process and use recited in the preamble and step [3] of claim 1 are concerned.' *In re Hirao*, 190 U.S.P.Q. at 17. The issue, as stated by the C.C.P.A. was "whether appellants' three-step process [was] obvious, the first two steps being unobvious but forming a known product, and the third step being the use of this known product in an obvious way." *Id.* The C.C.P.A. reversed the rejection, finding that "the subject matter as a whole would not have been obvious to one of ordinary skill in the art at the time invention was made." *Id.* (emphasis added).

Here, as in *Kropa*, the phrase "drilling fluid system" is "a vital term" of the claims" and is "a limitation which is material to the issue, and must be observed." *Id.*

The examiner has not pointed to a teaching or suggestion of the invention of claims 63-67, 69-74, 79-81, 83-88, 97-103, and 111-113 in Fukutani. Nor has the examiner pointed to a teaching or suggestion in Fukutani of an expectation of success of the invention. Applicant respectfully requests that the rejection of claims 63-67, 69-74, 79-81, 83-88, 97-103, and 111-113 over Fukutani be withdrawn.

-Rejection of Claims 1-15, 19-32, 63-69, and 121 as obvious over U.S. Patent No. 3,761,410 to Mondshine

The examiner rejected claims 1-15, 19-32, 63-69, and 121 as obvious over U.S. Patent No. 3,761,410 to Mondshine et al.

-Response

Mondshine is directed to "water base drilling fluids having enhanced lubricating properties under low load non-extreme pressure conditions by incorporating therein a material selected from the group consisting of vegetable oils, animal fats, fatty acids, fatty acid esters, fatty amides, their sulfurized or sulfated reaction products, and mixtures thereof, and a water insoluble alcohol." Mondshine, col. 1, ll. 13-23. Mondshine explains that "the addition of a water insoluble alcohol having from four to fifteen carbon atoms to a water base drilling fluid to which a lubricating additive is also added increases the lubricity of the water base drilling fluid to a much greater extent than does either the lubricating additive or the alcohol alone." Mondshine, col. 3, ll. 28-34. According to Mondshine, "[t]his synergism which occurs enables low concentrations of the lubricating additive and the alcohol to be used in the drilling fluid." *Id.* at 34-37.

-Claims 1-15 and 19-32

The examiner has not pointed to a teaching or suggestion in Mondshine of a lubricant "consisting essentially of" a "dispersion in a carrier fluid" of "at least one fatty acid soap comprising at least one alkali metal having a valence of 1." Claim 1.

The examiner has not established that a person of ordinary skill in the art would be motivated to modify Mondshine in the manner required to produce the claimed combination.

The examiner has not made particular findings as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected the claimed components for combination in the manner claimed. *Id.* The examiner certainly has not provided a "finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [Applicant's] invention to make the combination in the manner claimed." *Id.* at 1318.

Applicant respectfully requests that the rejection of claims 1-15 and 19-32 over Mondshine be withdrawn.

Claims 63-69

With respect to claims 63-69, the examiner points to the teaching at col. 6, ll. 50-64 that "[t]he water base drilling fluids in which the lubricating additive and water insoluble alcohol synergistically increase the lubricity may be based on fresh water, salt water, saturated salt water, sea water, or other waters normally used in preparing water base drilling fluids." The examiner takes the position that "the combination of salt water/sea water and vegetable oil will result in sodium salts of the vegetable oils." Office action, page 3.

The examiner has not pointed to a teaching or suggestion in Mondshine of a drilling fluid system comprising "a dispersion comprising a quantity of at least one fatty acid soap comprising at least one alkali metal selected from the group consisting of lithium, potassium, rubidium, cesium, and combinations thereof." Claim 63. The examiner therefore has not pointed to a teaching or suggestion of the invention defined by the claims in Mondshine. *In re Vaeck*, 20 U.S.P.Q.2d at 1442. Nor has the examiner pointed to a teaching in Mondshine of a reasonable expectation that the a drilling fluid system comprising a "quantity" of the claimed fatty acid soap would be "effective to form a coherent lubricating film on metal surfaces of drilling equipment exposed to said dispersion." Claims 63, 79, 97, and 111. The examiner therefore has not pointed to a reasonable expectation of success in Mondshine. *In re Vaeck*, 20 U.S.P.Q.2d at 1442.

The examiner also has not established that a person of ordinary skill in the art would be motivated to modify Mondshine in the manner required to produce the claimed combination. The examiner has not made particular findings as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected the claimed components for

combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d at 1317-1318. The examiner certainly has not provided a “finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [Applicant’s] invention to make the combination in the manner claimed.” *Id.* at 1318.

Applicant respectfully requests that the rejection of claims 63-69 over Mondshine be withdrawn.

Claim 121

With respect to method claim 121 and claims depending therefrom, the examiner has not pointed to a teaching or suggestion in Mondshine of a method comprising “exposing at least one metal surface of said drilling equipment to a fluid comprising a dispersion comprising a quantity of at least one fatty acid soap comprising at least one alkali metal.” Claim 121, emphasis added. The examiner has not pointed to a teaching or suggestion in Mondshine of such a drilling fluid system where “said dispersion comprising a quantity of at least one fatty acid soap comprising at least one alkali metal selected from the group consisting of lithium, potassium, rubidium, cesium, and combinations thereof.” New claim 123. The examiner certainly has not pointed to a teaching or suggestion in Mondshine of such a drilling fluid system where the fatty acid soap is lithium stearate. Claim 122.

The examiner has not pointed to a teaching or suggestion of a reasonable expectation that exposure of drilling equipment to such a dispersion would be “effective to produce a coherent lubricating film on said metal surface.” Claim 121. Nor has the examiner made “particular findings as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected the claimed components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d at 1317. The examiner certainly has not provided a “finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [Applicant’s] invention to make the combination in the manner claimed.” *Id.* at 1318.

As a result, maintenance of the rejection would fail to consider the invention as a whole. Under 35 U.S.C. § 103: *Jones v. Hardy*, 220 U.S.P.Q. 1021, 1025 (Fed. Cir. 1984). “Failure to

consider the claimed invention as a whole is an error of law." *Id. Jones v. Hardy*, 220 U.S.P.Q. 1021, 1025 (Fed. Cir. 1984).

Applicant respectfully requests that the rejection of claim 121 over Mondshine be withdrawn.

-Rejection of Claims 1-122 as obvious over Clark (5,658,860), alone or in combination with Chesser (6,403,537)

The examiner also rejects claims 1-122 as obvious over Clark, (5,658,860) alone or in combination with Chesser (6,403,537). The examiner contends that "Clark teaches that derivatives of the fatty acids may be used including alkali metal derivatives." Office action, p. 4, citing col. 5, ll. 37-58. The examiner contends that "Clark clearly meets the limitations of most of the" claims, and that Chesser "is added to teach that drilling fluid systems conventionally contain acrylamide monomers" Office action, p. 4.

Response

Clark describes a "well fluid emulsion having a water phase and an oil phase of a sulfurized alcohol and a naturally occurring fat, oil, or derivative thereof." Clark, abstract. Clark explains that "the inventors have surprisingly discovered that an otherwise toxic sulfurized alcohol can be rendered non-toxic by solubilizing such sulfurized alcohol in an alcohol." Clark, col. 3, ll. 4-7. Clark's well fluid is described as "an oil-in-water emulsion well fluid, with oil or hydrophobic phase, and a water phase" wherein "the base fluid is water . . . [and] the oil-phase of the oil-in-water well fluid . . . may include any non-water soluble material that will provide the required rate of penetration or lubrication . . . [including] naturally occurring fats and oils." Clark, col. 4, ll. 45-58.

-Claims 1-62

The examiner has not pointed to a teaching or suggestion in Clark of a lubricant "consisting essentially of" the claimed components of amended lubricant claims 1-62.

The examiner has not pointed to a teaching or suggestion in Clark of a lubricant "consisting essentially of" a "dispersion in a carrier fluid" of "at least one fatty acid soap comprising at least one alkali metal having a valence of 1." Claim 1. The examiner has not

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